

Name: \_\_\_\_\_

### at1117paper: Complete the Square (v303)

#### Example

A square's edge length is  $x$  feet. A rectangle has a height of  $x$  feet and a width of 28 feet. Their combined area, found by adding the square's area and the rectangle's area, is 380 square feet. What is the value of  $x$ ?

#### Example's Solution

$$x^2 + 28x = 380$$

To complete the square, add  $(\frac{28}{2})^2 = 196$  to both sides.

$$x^2 + 28x + 196 = 576$$

Recognize the left side is now a perfect-square trinomial. Factor the left side.

$$(x + 14)^2 = 576$$

Undo the squaring.

$$x + 14 = \pm\sqrt{576}$$

$$x + 14 = \pm 24$$

Subtract 14 from both sides.

$$x = -14 \pm 24$$

In this geometric example, we are only concerned about the positive solution. So,

$$x = 10$$

#### Question 1

A square's edge length is  $x$  feet. A rectangle has a height of  $x$  feet and a width of 46 feet. The total area, of the square and rectangle, is 1407 square feet. What is the value of  $x$ ?

**Question 2**

A square's edge length is  $x$  feet. A rectangle has a height of  $x$  feet and a width of 60 feet. The total area, of the square and rectangle, is 1036 square feet. What is the value of  $x$ ?

**Question 3**

A square's edge length is  $x$  feet. A rectangle has a height of  $x$  feet and a width of 52 feet. The total area, of the square and rectangle, is 1824 square feet. What is the value of  $x$ ?